

## Compositions for Chemical Mechanical Planarization Of Copper

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### ABSTRACT

The present invention relates chemical mechanical planarization ("CMP") of copper surfaces and describes copper CMP slurries including an oxidizer, one or more hydroxylamine compounds and at least one abrasive. The hydroxylamine compositions can include hydroxylamine nitrate, hydroxylamine, hydroxylamine sulfate, hydroxyl ammonium salts and mixtures thereof. The oxidizers may further include citric acid as a complexing agent for copper. Sulfuric acid and/or nitric acid provide means for modifying the pH of the oxidizer so that the hydroxylamine chemistries are acidic. Some embodiments include corrosion inhibitors such as benzotriazole, 2,4-pentadione dioxime and/or 1,6-dioxaspiro[4,4] nonane 2,7-dione. Some embodiments also include a free radical inhibitor, advantageously hydrazine. Colloidal silica and milled alumina are used as typical abrasive components.